## Chapter 3

# Operations

This chapter addresses Paladin battalion, battery, platoon, and section level operations. Additionally, it provides TTP for Paladin unique occupation procedures and insights on CSS for Paladin units.

## SECTION I - BATTALION OPERATIONS

### BATTLE COMMAND

3-1. Battle command is the art of decision making and leading. It includes controlling operations and motivating soldiers and their organizations into action to accomplish missions. The battle command process of a Paladin battalion is impacted by four methods of employment available for the three firing batteries. Firing batteries can be employed using battery, platoon, paired, and single howitzer methods. Effective battle command relies upon well-trained subordinate units because each of the three batteries may employ various methods as dictated by METT-TC. The battle command process with each method must be rigorously rehearsed to enable rapid delivery of fires in support of the maneuver commander.

#### TACTICAL OPERATIONS CENTER (TOC)

3-2. Within the battalion command post (CP) the operations, intelligence, and fire direction sections make up the TOC. The TOC provides C2 for current and future operations. The battalion S3 is responsible for TOC operations. Its composition is the same as all cannon field artillery battalions. TOC operations are discussed in FM 6-20-1.

##### Jump TOC

3-3. The jump TOC is an element of the main TOC specifically designed to facilitate the movement of the main TOC. It is normally characterized as a vehicle(s) and personnel capable of reconnaissance of the TOC's planned route and future position. It establishes local security and communications until the main TOC's arrival. The jump TOC may have to assume C2 of the battalion during the movement of the main TOC.

##### Designated POC

3-4. The S3 or battalion FDO may designate one POC to assume tactical fire control of the battalion based on the ability to communicate with battalion FDC and all other POCs. This method is most effective when the S3 or his designated representative is positioned at the designated POC prior to the battle handover.

### MUTUAL SUPPORTED UNIT (MSU) OPERATIONS

3-5. MSU operations, while highly effective, require rehearsals and a great deal of coordination. Unit TSOPs must address the details of battle handover with the reinforcing field artillery battalion and the brigade fire support element (FSE). Tactical fire control will be simplified with a similar reinforcing battalion (i.e., cannon artillery). However, it is possible for a multiple launch rocket system (MLRS) battalion to assume control provided the reinforcing artillery commander clearly understands the tactical maneuver plan and all assigned essential field artillery tasks (EFATs).

## DISPLACEMENT

3-6. The Paladin battalion uses the same displacement options as other platoon-based units. Under normal conditions, the smallest unit for tactical displacement is the platoon. This facilitates command, control, and logistical operations. The platoons move as individual march elements.

## POSITIONING

3-7. The Paladin battalion is positioned to accomplish its assigned tactical mission. Considerations during PA coordination include the following:

- The ability to accomplish the battalion's essential fire support tasks (EFSTs) and EFATs. EFSTs/EFATs are the primary tools used by the battalion S3, the staff, and battery commanders to focus Paladin fires and prioritize tasks. EFSTs are discussed in FM 6-20-40. EFATs are discussed in FM 6-20-1.
- Maximum range requirements and available ammunition to support EFSTs/EFATs.
- Terrain suitability.
- Communications with higher, lower, and adjacent units.
- Survivability.
- Future operations.

## TERRAIN MANAGEMENT AND COORDINATION

3-8. The S3 manages and coordinates terrain use with maneuver units. Land management considerations include using larger platoon areas of operation (compared to earlier M109 series howitzers) and sharing the same land with other units.

3-9. When an M109A6 battalion is assigned a DS mission, the fire support coordinator (FSCOORD) and his S3 anticipate the requirement to move the batteries and coordinate with the maneuver commander or S3 through the FSE. The commander, S3, and fire support officer (FSO) perform an initial map reconnaissance to identify possible PAs. These areas must allow the battalion to support the scheme of maneuver. The field artillery (FA) battalion reconnaissance survey officer (RSO) and/or the firing BCs and GSGs confirm suitability of positions by reconnaissance, as the situation permits.

3-10. At battalion level, the Paladin adds flexibility to the planning and coordination process. Because the traditional line of metal no longer exists, the Paladin platoon can occupy places unsuitable for conventional artillery. A Paladin unit can occupy wooded areas, urban areas, or areas with dense undergrowth. If an area is open enough for individual howitzers to establish an AOF (considering site to crest) and the ground is firm enough to allow one or more howitzers to move around, the area is suitable for M109A6 operations. Since there is no need to lay with an aiming circle, intervisibility between the Paladins is not absolutely required. However, it should be a consideration, as it allows for mutual defense and facilitates reciprocal lay in degraded operations.

3-11. A Paladin platoon PA may require an area on the order of 1,500 by 3,000 meters. There may be more than one firing area within a platoon PA. The greater the threat of counterfire, the more the Paladin conducts survivability moves within a given firing area. However, Paladin does not require sole use of this terrain. With proper coordination, maneuver units can pass through a Paladin PA without disrupting operations.

3-12. The Paladin battery normally operates in a band of terrain 1 to 8 km behind the forward maneuver units, competing with other friendly units for PAs. Maneuver commanders may resist sharing space with Paladin units because of the potential for enemy counterfire. This is particularly true for less mobile units. However, wide dispersion of Paladin across a brigade front minimizes the effectiveness of enemy counterfire. Since Paladin does not require sole use of terrain, land management is facilitated by the ability to co-use PAs.

3-13. Coordination of terrain with the supported maneuver unit must be continuous. The FSE at the maneuver CP is the focal point for this coordination. The emphasis at this level should be on "NO-GO" areas for the artillery, rather than attempting to allocate individual PAs. The locations of friendly elements must be known in the battalion TOC, the battalion FDC, and the POCs. BCs and GSGs must keep the FA battalion S3 constantly apprised of problems encountered with friendly elements during reconnaissance and occupation of PAs. The battery commander should coordinate face-to-face with commanders in close proximity to his planned PA. This coordination may take place during brigade-level combined arms rehearsals.

## SURVEY OPERATIONS

3-14. Survey operations must be carefully planned and controlled to maximize accuracy by minimizing circular error probable (CEP). As with traditional cannon artillery, all survey control should originate from a common source. Limited survey assets (two position azimuth determining systems (PADS) and one conventional survey party for six platoons), dispersed firing elements, and greater survey requirements demand a well-coordinated plan. If not GPS aided, the navigation subsystem (DRU-H) will require navigation updates. SCPs are necessary to ensure each howitzer maintains the following accuracy:

- Position - 18 meters CEP.
- Elevation - 10 meters probable error (PE).

3-15. If ZUPTs are not performed when prompted, the 18-meter CEP may be exceeded.

3-16. Survey planning and coordination are a critical aspect of survey operations. The planning process begins with guidance (priority of survey) from the battalion S3 and continues for the duration of the operation. Execution of the survey plan requires continuous coordination among the firing battery commanders, the S3, and the RSO.

## COMMUNICATIONS

3-17. Survey information can be transmitted in a number of ways. These include face-to-face meetings, voice or digital radio communications, and written tags left at marked SCPs. Normally, survey information is transmitted to individual batteries by voice on the battery command net.

## SURVEY CONTROL POINTS

### General

3-18. SCPs are used to establish positional control. The locations of SCPs are prioritized based on time available and accuracy of the system. A confidence check point (CCP) is a SCP with an established end of the orienting line (EOL). When a howitzer's navigation system is experiencing failures it uses the CCP to conduct a confidence test. Confidence test procedures are found in TM 9-2350-314-10.

### Navigation Update Points

3-19. A navigation update point is simply a surveyed point on the ground where the howitzer can update its location in the AFCS (E, N, and alt). As part of position improvement, a SCP should be established in the PA. Specific placement of the SCP is the responsibility of the BC or GSG and is based on their reconnaissance of the PA.

3-20. If there is no rearm, refuel, resupply, and survey point (R3SP) planned, the battalion should establish three SCPs along the route of march, spaced 50 - 100 meters apart. The SCPs should be easily identifiable, accessible, and within a reasonable distance of the release point of the tactical road march. Their use permits the entire platoon to update simultaneously, without holding up the rest of the battalion.

3-21. If the battalion has established a R3SP, there should be a SCP established at each heavy expanded-mobility tactical truck (HEMTT) tanker, permitting the howitzers to perform a navigation update while refueling.

### Global Positioning Systems

3-22. A secure GPS can be used to establish SCPs that the howitzers can use for navigation update points. The use of secure GPS provides the PADS team the time and flexibility to accomplish other survey missions (i.e., task force mortars, target acquisition (TA) radars, and fire support teams (FISTs)). An independent, secondary check must be performed to validate the grid location

determined by the secure GPS. Refer to FM 6-50, Chapter 4 for guidelines in using GPS.

**Position Marking**

3-23. SCPs are usually marked with a short wooden stake or a .50 caliber shell casing. The stake must be positioned where it can be seen from a distance. They are normally tagged with a distinctive survey marker and are positioned to allow the howitzer to navigate its front hub in close proximity to the marker. Each SCP requires the following minimum information: E, N, alt, spheroid, datum, and grid zone. The information should be legible and the letters large enough for the driver to read from his seat as he positions the gun's left front sprocket within one meter of the SCP. The information should be written in indelible ink on the conventional shoe tag, 3 x 5 card, or a small placard affixed to the stake facing the driver. All survey data must be verified using an independent, secondary check.

## SECTION II - BATTERY OPERATIONS

### BATTLE COMMAND

3-24. Battery operations are defined as one POC controlling all six howitzers in an area that is approximately 3,000 X 3,000 meters. The Paladin firing battery normally operates with two firing platoons. However, the BC may designate one POC to control all six howitzers to meet mission requirements. A typical example where this may occur would be fast moving operations where the BC designates a controlling POC and positions the other POC at a point to facilitate continuous operations. Battery operations are also used when one POC is degraded and not capable of fire direction.

### EMPLOYMENT OF HOWITZERS

3-25. The controlling POC can employ the howitzers as one battery element, two platoons, in pairs, or as single howitzers. Employment is based on the commander's assessment of METT-TC (see Figure 3-1). Employment advantages using battery operations include standardization of crew drills for fire direction personnel, continuous operations, centralized battle command and logistical support, and enhanced security.

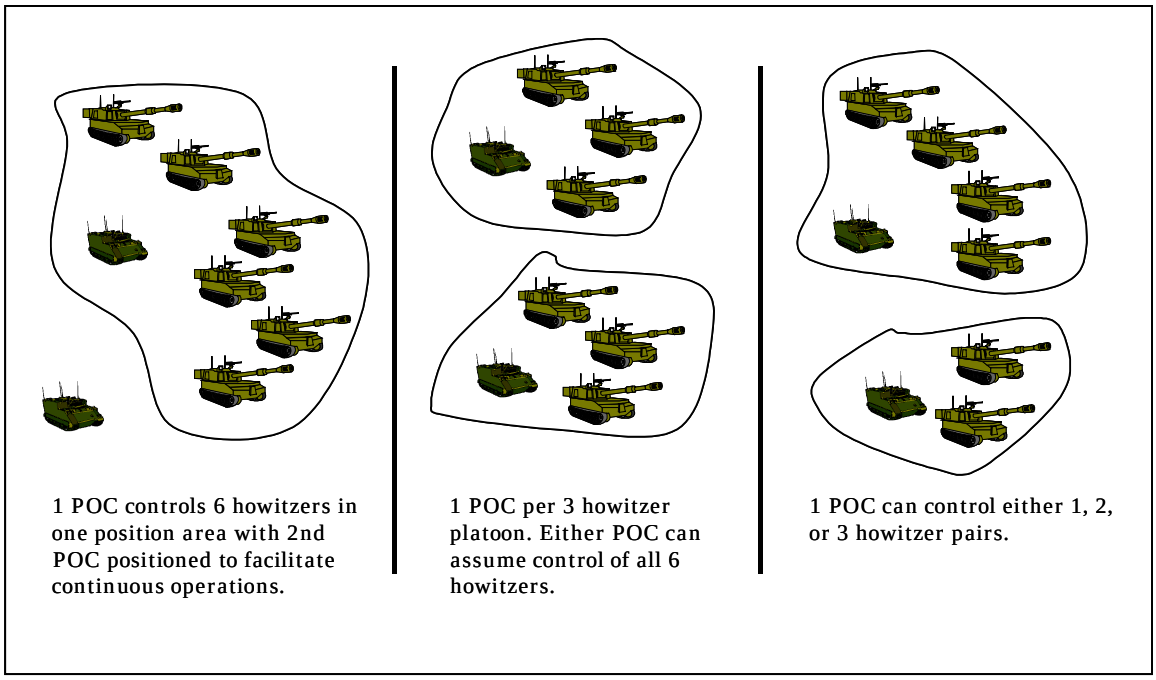


**Figure 3-1. Employment Options**

## RECONNAISSANCE, SELECTION, AND OCCUPATION OF POSITION (RSOP)

3-26. The battery commander must issue clear guidance and task organize to effectively reconnoiter battery positions. If the displacing elements move at the same time and are not greatly separated, one POC can control movement. If the elements move separately, either by time or route, movement reverts to platoon control. Separation of the platoons increases the difficulty of command, control, and logistics.

### RECONNAISSANCE

3-27. The BC receives a warning order to relocate the battery. He is given general locations to reconnoiter for suitability. He assembles the reconnaissance elements of one or both platoons and rendezvous with a battalion survey team if one is available. The platoon reconnaissance element is normally the platoon GSG and his driver augmented with additional personnel to meet mission requirements. The following tasks must be accomplished during reconnaissance:

- Reconnoiter routes to the new PAs. Emplace SCPs along the route to perform navigation updates as required.
- Reconnoiter the planned platoon PAs and report their suitability to the battalion CP. Key concerns are the track plan, obstacles, site to crest, cant, and communications (i.e., POC to battalion FDC, POC to guns).
- Conduct face-to-face coordination with any friendly elements that may be in the vicinity. For a detailed discussion of conventional RSOP procedures, see FM 6-50, Chapter 2.

## DISPLACEMENT

3-28. The Paladin battery can displace the same as all other platoon-based units (battery, platoon, pairs, sections).

### Rapid Movement Option

3-29. Move rapidly to the new position. Disregard ZUPTs and navigation updates. Understand accurate firing unit location has been compromised and some method of registration is required. Establish firing unit location using hasty survey techniques. Conduct a navigation update using 5th order survey as soon as possible.

### Survey Not Available

3-30. If survey is not available in the new position, the commander can expect the errors noted in the following graph (Figure 3-2):

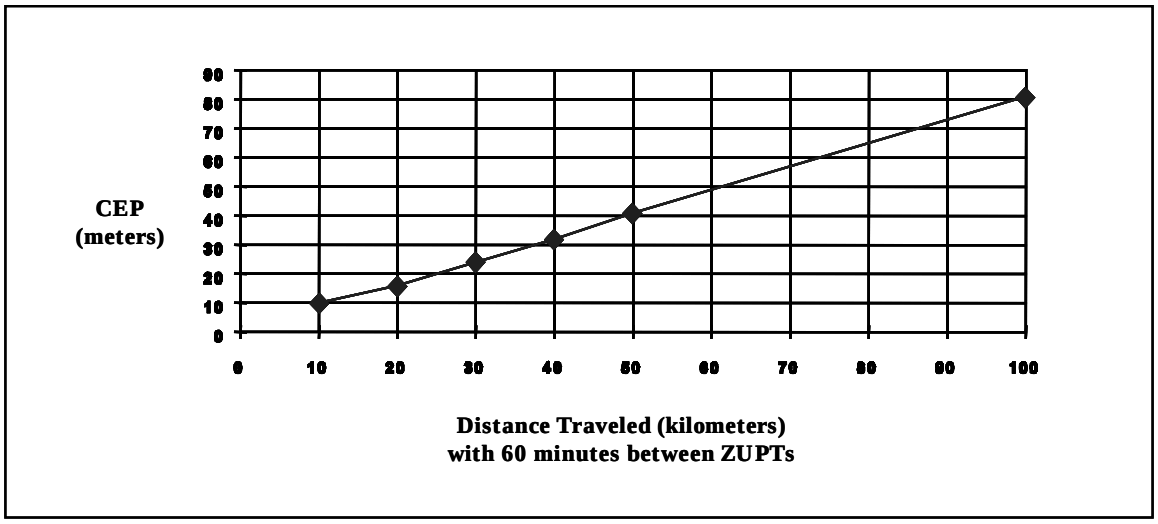


**Figure 3-2. Circular Error Probable versus Distance Traveled**

3-31. DRU-H data should be verified with a map spot or a GPS with particular attention given to altitude, as it is the most sensitive to traveling without an update.

## POSITIONING SUPPORT ASSETS

3-32. The important consideration for positioning the battery support elements is that they must be able to respond quickly to platoon elements without encumbering operations. There are three options referenced in FM 6-50 for positioning battery support elements:

- Heavy-heavy.
- Heavy-light.
- Light-light.

3-33. The heavy-heavy option divides the support elements in half and assigns them to each platoon. The heavy-light option positions all of the

support elements in one platoon PA. The light-light option positions all of the battery support elements in a separate location away from both platoon areas.

### MOVEMENT CONSIDERATIONS IN THE OFFENSE

3-34. Paladin offensive operations are often non-stop and characterized by firing high volumes of missions. Positioning options in the offense are tied to movement methods designed to provide continuous fire support.

3-35. During a movement to contact/hasty attack, the battery may move in separate platoon formations and move the battery headquarters as a separate element. If the wedge formation is used, the platoons may travel in their own wedge or a battery consolidated wedge with the controlling POC and headquarters elements located inside the formation for protection. The other POC can be repositioned to assume control in a fast moving scenario. If the terrain is restrictive, the BC may move in columns to keep pace with the battle. Areas that must be addressed are the locations of the key leaders, maneuver graphics, terrain, and the scheme of maneuver.

3-36. The BC must consider the following during offensive operations:

- Navigation update points along the route of march.
- Rearm, refuel, and resupply operations.
- Hipshoot procedures.
- Location of the POC in the formation.
- Location of the platoon leader during movement.
- Distance between vehicles and positive identification of the trail vehicle in the maneuver formation.
- Situational awareness at the section level (i.e., changing maneuver graphics, minefield locations, chemical strikes, and location of enemy reconnaissance units).

## ARTILLERY TROOP LEADING PROCEDURES

3-37. Troop leading procedures (TLPs) provide a mental framework to ensure complete preparation, dissemination, and execution of the battery mission. The process provides a checklist for all leaders from receipt of the mission to execution (FM 6-50, Chapter 2). The steps may occur out of order or simultaneously after receipt of the mission. It is imperative that leaders understand that TLPs will be tailored for Paladin specific tasks. For example, EFATs will dictate turret load, FAASV load, movement options, resupply options, and other tactical considerations.

# SECTION III - PLATOON OPERATIONS

## BATTLE COMMAND

3-38. Platoon operations are defined as a POC controlling three howitzers in a PA that is approximately 1,500 X 3,000 meters (see Figure 3-3). The numbers of howitzers in each platoon may be altered and various employment techniques can be used to meet mission requirements. C2 is

critical to maintaining responsiveness and survivability of the platoons. TLPs reinforce and expedite dissemination of information to the section chief.

3-39. Issuance of orders is a critical link in fire mission processing. The POCs must be positioned to receive C2 from battalion and to issue C2 to the sections. To ensure this, the GSG must make communications checks with battalion as part of the RSOP procedures. He must assess the ability of the POC to communicate with all of the howitzers in each firing position.

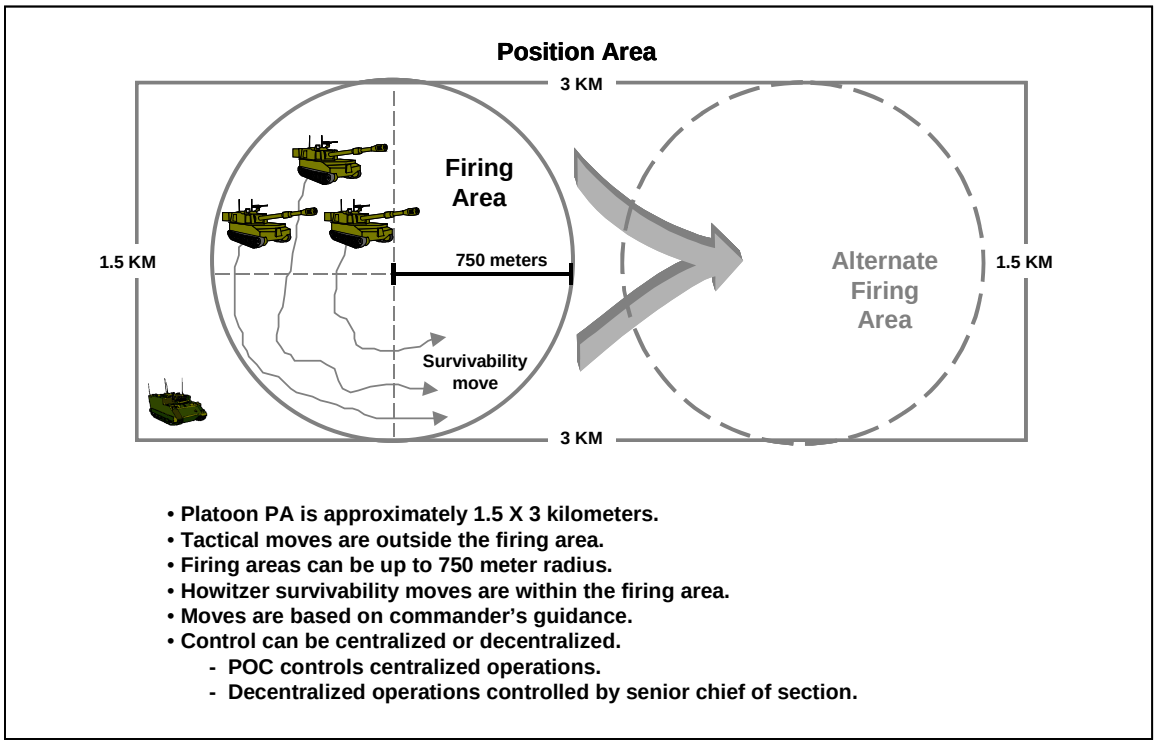


**Figure 3-3. Platoon Operations**

## RSOP

### RECONNAISSANCE

3-40. The BC and GSG must determine the suitability of the position for Paladin operations and determine whether enemy ground forces, mines, or chemical hazards are present. Since there is no need to establish individual howitzer positions or determine initial deflections the advance party will usually consist of only the GSG and his driver. However, it may include any other personnel specified by the unit TSOP or required by the tactical situation. The primary function of the advance party is to determine what general areas or zones that his unit can operate within as a battery or platoon of howitzers. Mine sweeping and chemical monitoring are performed consistent with the threat.

3-41. Enroute to the new platoon PA, the GSG coordinates with the BC or RSO for the locations of the SCPs required for updating the howitzers while

enroute. The GSG verifies the SCPs, establishes a track plan, and reports any problems to the BC or platoon leader to include locations of friendly and enemy elements. RSOP operations are facilitated with the GSG's card. An example card is shown at Figure 3-4.

3-42. The GSG identifies the POC location, potential target reference points (TRPs), and enemy avenues of approach. This information is graphically displayed on the initial PA/defensive diagram and given to the platoon sergeant/platoon leader upon his arrival (time permitting). After the platoon sergeant/platoon leader refine and approve the defense diagram/firing area map, the POC will use it to overlay the HTC (see Chapter 4).

| Task | Planned | Actual |
|---|---|---|
| Center Grid (only refine if necessary | E: N: Alt: | E: N: Alt: |
| Radius (meters) | | |
| Min QE of Immediate Crest | | |
| Range | | |
| Sight | | |
| Object | | |
| Radio Check with Battalion FDC | Yes/No | |
| Entry Point | | |
| Grid | E: N: | E: N: |
| Description | | |
| POC Location | E: N: | E: N: |
| Terrain Restrictions | | |
| Route Restrictions | | |
| Firing Area Restrictions | | |
| Visible Distant Aiming Point | Yes/No Description: | |
| Travel Time | | |
| Rally Point | | |
| Additional Information | | |
| Note: Send the ready to fire information as soon as it is determined. Send as much of the report as is completed before platoon departs from start point. | | |

**Figure 3-4. Example Gunnery Sergeant's Card**

3-43. Note: If the platoon is operating in a fully degraded mode, the platoon leader can use M109A5 tactics. FM 6-50 explains conventional RSOP procedures. Consider restrictions in TM 9-2350-314-10.

## DISPLACEMENT-SURVIVABILITY MOVES

3-44. In a mid- to high-intensity threat environment, the COS must assume that the enemy's TA assets acquire the first round fired from any position. In this case, the enemy may respond in as little as 5 to 12 minutes. The Paladin survives with the combination of movement and dispersion. A survivability

move of 300 to 500 meters removes the platoon or howitzers from the target footprint of most threat artillery systems. The FSCOORD, S3, and BC evaluate the available intelligence preparation of the battlefield (IPB) and issue guidance to the platoons concerning survivability measures. Managing survivability moves requires teamwork between the howitzers and the POC.

## METHOD OF CONTROL

3-45. The POC must coordinate movement of the howitzers within the platoon area. The BC can move his vehicles within the firing area by either a decentralized or centralized method. With the decentralized concept, the POC provides movement criteria and the senior COS of the platoon directs movement of the howitzers to the new firing positions within the firing area. Centralized movement requires the POC to tell the howitzers when and/or where to move. See Chapter 4 for more details on control of howitzer movement.

## METHODS OF POSITIONING THE POC

3-46. To avoid enemy counterfire, the POC should be positioned outside the firing area. It must be located to effectively communicate with battalion FDC and its guns. Once positioned, the POC does not routinely move within the platoon area but relies on cover and concealment to survive.

## METHODS OF EMPLOYING HOWITZERS

### Platoon

3-47. Within a platoon PA, three howitzers are normally positioned individually and work together under the supervision of the senior COS. The three section chiefs coordinate movement and move as a team. The sections maximize dispersion based on the factors of METT-TC. The method of employment depends on the tactical situation. As an example, a platoon may operate as single sections to maximize dispersion during a high air threat. The number of howitzers in each platoon may be changed to execute multiple missions or special missions. The normal platoon configuration is one POC controlling three howitzers. The advantages to positioning Paladins as a platoon versus a battery are as follows:

- Provides dual mission capability (multiple missions).
- Better leader ratio (gunnery and platoon sergeants, platoon leaders).
- Increased survivability (more dispersed).
- Facilitates communications (more dispersed with two POCs).

### Paired

3-48. This concept requires two howitzers to operate in a firing area with a radius up to 750 meters. A senior COS is designated and he acts as the team leader. During paired operations, the two howitzers move together and should stay visible to one another. Survivability is enhanced by maintaining a distance of at least 100 meters between the howitzers in the pair. When METT-TC allows, chiefs of section should maximize separation. Howitzers can be much closer than 100 meters in built-up or heavily wooded areas. They can be farther apart in more open terrain, such as the desert, but must

be vigilant to stay in their assigned area. BCs and platoon leaders should consider paired howitzer operations when the enemy counterfire threat is high and the threat from a dismounted ground attack is low. The advantages of paired operations over single howitzers are:

- Allows for mutual ground and air defense.
- Provides an independent check of position and azimuth.
- Gives ability to perform degraded operations (see Appendix A).

**Single Howitzer**

3-49. Single howitzer operations are one section operating autonomously in an exclusive firing area. The POC controls the section and it is placed on the HTC (see Chapter 4) as a separate firing area. This is the most difficult operational mode to battle command, as it requires the highest degree of crew training and provides no means for mutual support against ground or air threats.

## TERRAIN MANAGEMENT AND COORDINATION

3-50. The M109A6 howitzers operate in a dispersed manner. They make survivability moves of 300-500 meters within a firing area and operate in a 1.5 X 3 kilometer platoon PA. This is about the same amount of space currently used by a prior M109 series platoon in establishing its two (primary and alternate) PAs. The key differences are discussed below:

3-51. Non-M109A6 units must select new PAs for survivability moves. Paladin units make all survivability moves within the same firing area.

3-52. Non-M109A6 units must have prepared alternate positions, while Paladin units do not. If a firing position becomes untenable, a Paladin can move to another firing position within its firing area to continue its mission (survivability move).

3-53. The Paladin can use areas not suitable for other cannon units. An area that prior M109 series platoons could not occupy may provide several single/pair M109A6 positions.

3-54. Paladin units do not need to be sole users of a platoon PA. Sharing land must be coordinated through the FA battalion S3. BCs must conduct face-to-face coordination with the unit commander sharing common ground.

# SECTION IV - SECTION OPERATIONS

## BATTLE COMMAND

3-55. A section, consisting of a howitzer and a FAASV, normally operates as one of three sections in a platoon, but may operate alone in a firing area under the control of the POC. Normally, the COS is responsible for both vehicles, although there may be times (such as during periods of intense high volume indirect fires) when the FAASVs will fall under the control of the platoon sergeant. Section operations are the least preferred option because the section is isolated and must provide its own defense. The COS relies on the ATC to overwatch the howitzer, particularly during firing.

## RSOP

### DISPLACEMENT

3-56. The section performs survivability moves to new firing positions within a firing area assigned by the POC. The COS coordinates movement with the ATC on the FAASV. The new position is improved as time permits.

#### Centralized

3-57. Sections operating under purely centralized control move as directed by the POC. This method of control may be dictated by the tactical situation, or may be used by units with inexperienced crews. The S3 may impose centralized control prior to executing scatterable mine (SCATMINE) minefields, preparations, or counter-preparations to ensure that the battalion can mass.

#### Decentralized

3-58. Normally, the platoon will operate in a decentralized mode. The COS must be able to choose a specific firing position within a firing area. As a minimum, he should keep in mind the following items:

- Center sector of fire.
- Obstacles to firing within the sector (site to crest).
- Communications with the POC.
- Any natural or man-made objects that provide protection or deter detection from the enemy.
- Any friendly elements sharing the firing area which may be endangered if the Paladin is targeted.

### POSITIONING OPTIONS

3-59. The platoon sergeant can use the following methods:

#### Mated

3-60. When mated, the gun must be on spades and the FAASV conveyor extended into the back door of the howitzer. The FAASV top rear door must be closed to avoid blast overpressure problems for the M992.

3-61. **Advantages.**

- Crew endurance is increased because personnel handle the ammunition less than in any other FAASV configuration.
- All rounds can be fired from the ammunition carried on the FAASV instead of firing on-board ammunition from the howitzer ammunition racks.
- Crew rotation for sleep and section defense is enhanced by close proximity of all crew members.
- The howitzer can draw electrical power from the FAASV for degraded operations.

3-62. **Disadvantages.**

- The howitzer rear door must be open to allow the ammunition feed path from the FAASV to operate effectively.
- The crew compartment of the howitzer is susceptible to nuclear, biological, and chemical (NBC) contamination.
- Exposes the crew to blast over pressure when firing M203 and M119-series charges.
- Counterfire survivability of the section is reduced because of the proximity of the howitzer to the FAASV.
- Using spades increases emplacement and displacement time and exposes crew to small arms fires.

### Separated

3-63. When separated the FAASV conveyor is not extended into the howitzer. The FAASV should be positioned far enough away from the Paladin to minimize the effects of enemy artillery, but near enough to supply the howitzer ammunition. The distance from the FAASV to the howitzer is METT-TC dependent. Intervisibility between the howitzer and the FAASV must be maintained.

3-64. **Advantages.**

- FAASV ammunition resupply simplified.
- Less susceptible to enemy artillery fire.
- Blast protection maximized.

3-65. **Disadvantages.**

- Ammunition resupply to howitzer is more manpower-intensive.
- Crew rotation is reduced.
- Sleep plan more difficult.

### Overwatch

3-66. The FAASV is positioned to provide early warning to the howitzers. It is positioned on terrain to cover danger areas or high-speed avenues of approach. Separation between the two vehicles may allow occupation of areas unsuitable for mated vehicles. There is no blast over pressure problem. The FAASV is normally positioned in the platoon PA but is not tied to howitzer location or movement. Emphasis is on concealing the FAASV, particularly from air observation.

3-67. **Advantages.**

- Enhanced defensive capability.
- FAASV is less susceptible to counterfire directed at the gun.
- Reduced visual signature.

3-68. **Disadvantages.**

- Ammunition resupply takes longer.
- Crew is separated and not immediately available.

- Sleep plan more difficult.
- Must fire only from ammunition on the gun.

## SECTION V - OCCUPATION

## PROCEDURES

3-69. This section outlines standard occupation procedures for Paladin units. These procedures provide reasonable assurances that all rounds fired will impact accurately and safely.

3-70. The Paladin occupation procedures are designed to maximize the system capabilities and allow the Paladin unit to train as it will fight.

3-71. The procedures outlined in this section describe a system of independent checks for both the POC and howitzer databases and related firing data. Independent checks are necessary to ensure that someone other than the person who performs the action verifies all actions that affect firing data. Though most independent checks take place before missions are received, performing secondary independent checks is a continuous process, and must be rigidly enforced to ensure fires are timely, accurate, and safe.

3-72. The employment of the Paladin howitzer is divided into four phases: initialization, conducting the tactical move, occupation of the position, and during firing.

### PHASE I: INITIALIZATION

#### Howitzer

3-73. Initialization/database checks occur either in the motor pool or whenever the AFCS has been shut down (IAW procedures found in TM 9-2350-314-10, Chapter 2). Unit TSOPs should list explicitly those settings to be made at the howitzer. Upon completion of initialization, the howitzer will conduct a verification mission with the POC to ensure accuracy of the ballistic solution. The platoon leader, assisted by the platoon sergeant and GSG will verify each howitzer's initialization database. At a minimum, they will verify the initialization grid (E, N, and alt).

#### POC

3-74. The POC initializes the LCU IAW procedures found in the applicable technical bulletin and their battalion TSOP. The Paladin weapons dependent program has five unique formats, two of which need to be completed during initialization (the HOW;SBT and HOW;UPDATE). The FDO/chief computer verifies that all entries made by the LCU operator are correct. Once communications with the guns are established, the POC will transmit the subscriber table, map modification (MAP MOD), met, and other pertinent ballistics data to the guns. This information flow is transparent to the guns.

3-75. **Verification Mission.** Once the guns have initialized, the POC will initiate a verification mission, specifying a converged sheaf, charge, shell-fuze combination, and lot using BCS (SYS;SETUP, GUNORD;X). This will produce firing data at the LCU which the POC records. Next, the POC removes X from the GUNORD field and re-executes the mission to all howitzers. The AFCS at each howitzer will compute firing data. The chiefs report charge, deflection, quadrant, and fuze time (if applicable) to the POC. The POC will compare the data computed by the AFCS to the data computed by the LCU. The data must agree within the following tolerances:

**Table 3-1. Verification Mission Tolerances**

| Data Item | Version 10 or Higher |
|---|---|
| Fuze Time | 0.1 second |
| Fuze Variable Time (VT) | 1 second |
| Deflection | 2 mils |
| Quadrant | 2 mils |

3-76. Verification missions must be conducted after initialization, or when an AFCS or LCU has powered down and powered back up again, or when a significant change to the database occurs. A significant change is one or more of the following: change in met, MVVs, or registration corrections. A howitzer's location is not considered a change, if the howitzer's location was properly verified by an independent means. Comparison between the AFCS data and the LCU data highlights gross inaccuracies in MVs, ammunition, fire unit, met, registration corrections, and powder temperature.

## PHASE II: CONDUCT TACTICAL MOVEMENT

### Howitzer

3-77. After initialization is complete, the guns are given movement orders by the POC. The movement order includes the guns proposed location, center sector AOF, start point (SP) time, and movement radius. The POC will use the location and radius provided by the GSG for use with the HTC.

3-78. If the tactical move is less than 27 kms, ZUPTs are performed and no faults detected, the howitzers begin occupation procedures. If faults are detected, acknowledge fault and perform appropriate level of degraded operations IAW Appendix A. If movement is greater than 27 kms or ZUPTs not performed, conduct navigation update at a SCP prior to arrival. Along the route of march close to the battalion release point or at an R3SP there will be one to four SCPs set up as described in Section I. The platoon arrives at the SCP and performs a navigation update. Upon completion of the navigation update, the section completes the movement.

3-79. If the DRU-H is GPS aided, units are not required to perform navigation updates and the AFCS normally will not prompt the operator to perform ZUPTs.

### POC

3-80. The POC transmits movement orders to the guns, sending them to a platoon PA. Included in the movement order is the center sector, left and right sector limits (if necessary), grid coordinates, SP time, and radius. Other instructions should be sent to the howitzer using a plain text message or voice communications.

## PHASE III - OCCUPATION OF POSITION

### One Howitzer

3-81. Once the howitzer stops, the COS records his position from the DU. Concurrent with this action, the howitzer's location is independently verified by the COS if not GPS aided. Next, the COS presses the arrive key which automatically transmits the piece status to the POC. Simultaneously, the driver releases the travel lock and the other members of the section conduct pre-fire checks.

3-82. The COS actions the maximum (max) tube elevation screen, and determines/inputs a one-line site entry between his left and right sectors of fire. It is recommended that the COS sweep 400 mils left and right of his center sector of fire to determine his one line site data. As part of position improvement, the COS will establish 6,400 mil site data. These entries will cause a warning message to be displayed on the DU if the firing limits are violated, except for load elevation. Occupation of position procedures are illustrated in the flow chart in Figure 3-5.

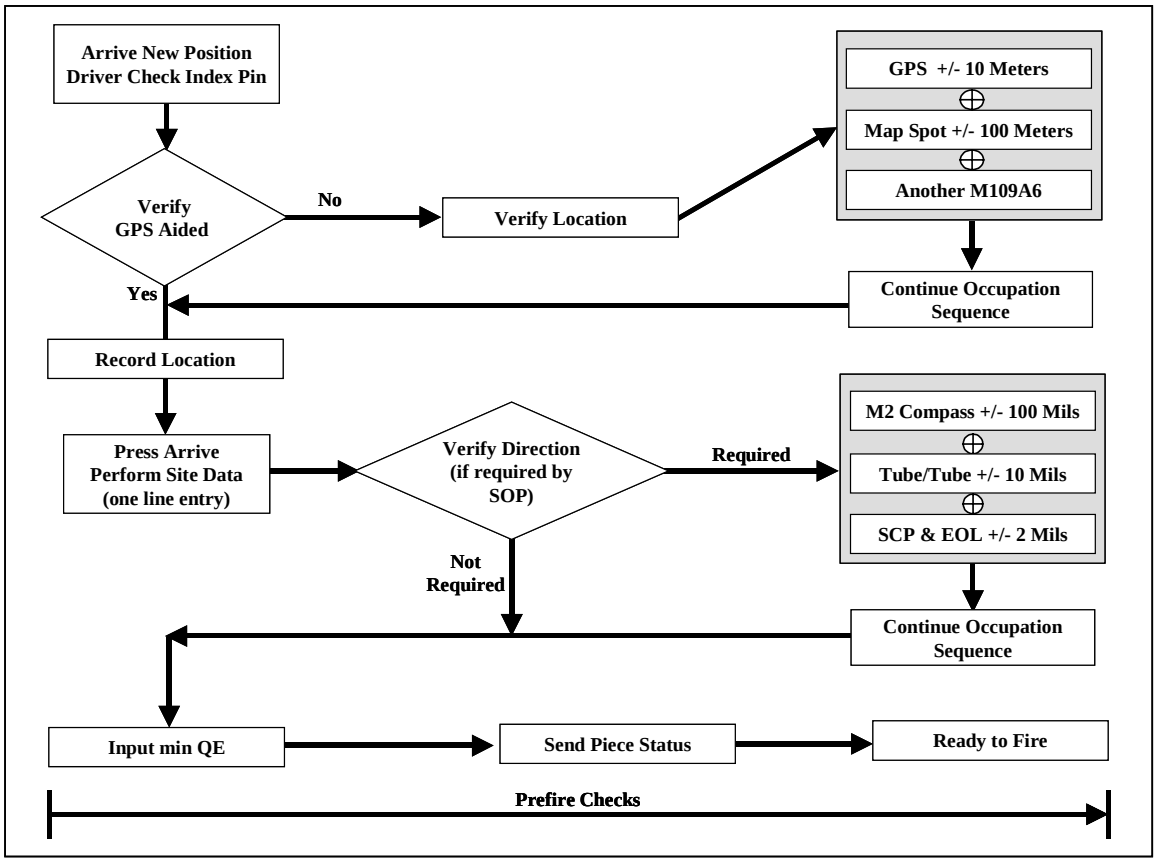


**Figure 3-5. Occupation of Position Flow Chart**

3-83. Once these checks are completed, the gun is considered safe and ready to fire (RTF). The RTF times are found in ARTEP 6-037-30 MTP, Appendix A (Table A-7 for normal occupations and Table A-7.1 for emergency/hipshoot missions). Next, the COS directs position improvements. These actions include but are not limited to: verifying boresight; establishing alternate aiming points; establishing 6,400 mil site data; visually identifying TRPs; establishing sectors of fire for crew served weapons; and transmitting updated piece status to the POC.

## POC

3-84. Refer to Chapter 4 for POC occupation drill.

## PHASE IV - DURING FIRING

### Howitzer Crew

- Section chief announces fire commands.
- Driver will record commands on the DA Form 4513.
- Chief verifies that fire commands are applied as announced (projectile, charge, and fuze).

- While laying the howitzer, the chief will verify the following to ensure the howitzer is properly laid: lay key is backlit, commanded and actual deflection/quadrant match, and the warning prompt, "warning tube is not in lay position" is not displayed.
- The gunner verifies the lay data and announces “verified." (If gunner does not announce “verified”, or data is not correct, "CHECK FIRING!" is announced, reason(s) why the command is unsafe are given, and corrective action taken)
- The chief then commands the number 1 man to prime, hook-up**,** and fire.

3-85. The POC is responsible to conduct a verification mission every time there is a significant change in the database, MVVs, met, and registration data. The POC is responsible for verifying that targets do not violate FSCMs and that the targets plot within the prescribed target area. It is imperative that the FDO or chief computer verifies the plot of the target and the target location that is input into the LCU.

## SURVIVABILITY MOVES

3-86. After completing a survivability move, if the howitzer remains within the prescribed radius, the requirement exists to determine site data, verify min QE, and transmit piece status (see Figure 3-6). For position improvement the howitzer section would input max QE, refine site data, send new piece status, and establish alternate aiming points.

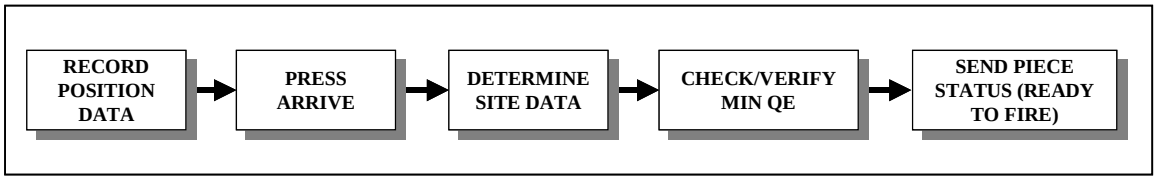


**Figure 3-6. Occupation from Survivability Move**

## EMERGENCY MISSIONS INSIDE FIRING AREA

3-87. These procedures apply when conducting survivability moves inside an assigned radius and the howitzer receives a fire mission. The COS takes the following actions: find a suitable location; press arrive key, press use all, and press enter on min QE screen; verify immediate crest along the commanded deflection and quadrant; and execute the fire mission (see Figure 3-7). There is no requirement to recompute firing limits since the howitzer is within its assigned radius.

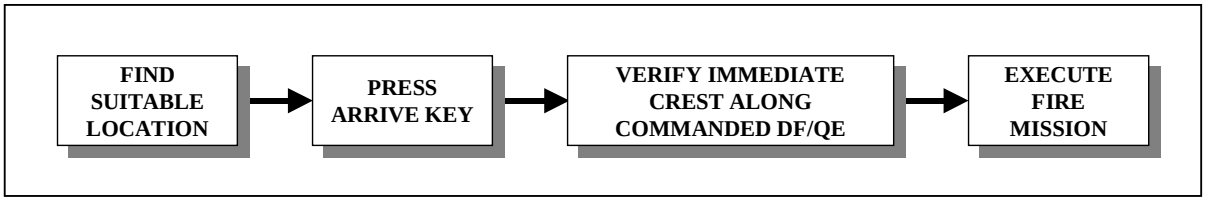


**Figure 3-7. Emergency Mission Inside Firing Area**

## EMERGENCY MISSIONS OUTSIDE FIRING AREA (HIPSHOOT)

3-88. The procedures for emergency missions outside the firing area (see Figure 3-8) are identical to emergency mission procedures inside a PA. The COS must verify his immediate crest along his commanded deflection. The POC announcing "fire mission" over the voice net enables the COS to reference his movement screen in verifying location.

3-89. Once the howitzer has stopped moving, if it is not GPS aided, the position is checked by a secure GPS and the COS verifies location.

3-90. The POC will ensure there are no intervening crests and the target does not violate any FSCMs.

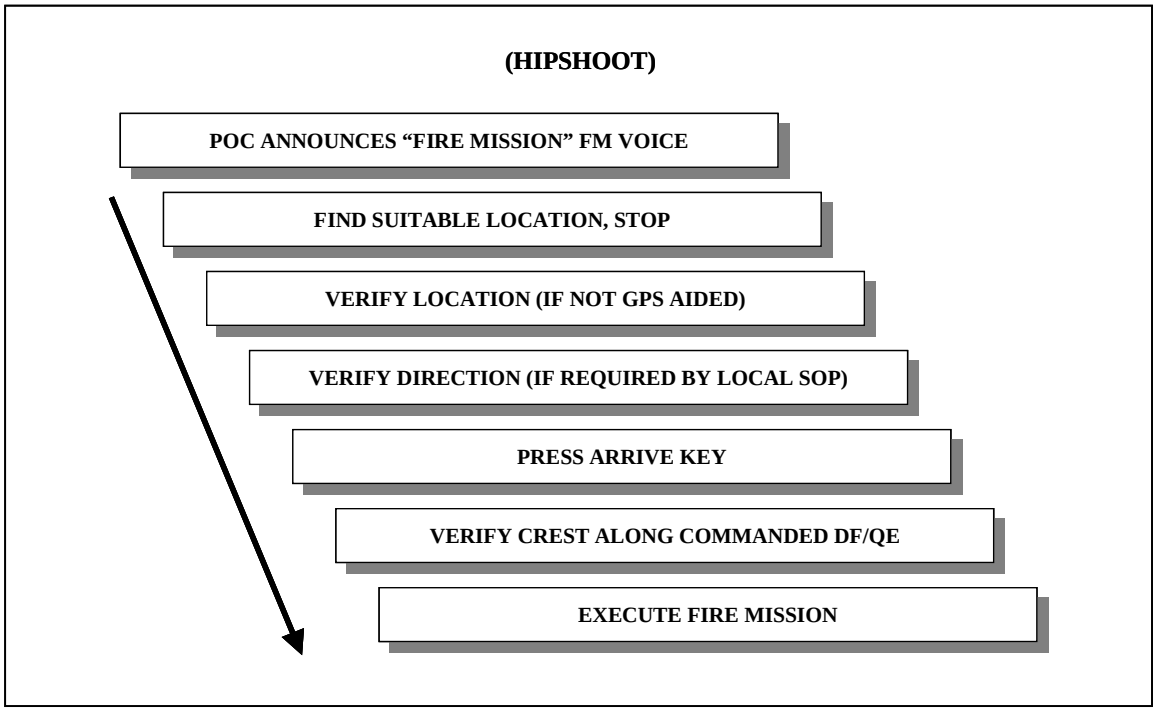


**Figure 3-8. Emergency Mission Outside Firing Area (Hipshoot)**

## VERIFYING DIRECTION

3-91. The DRU-H is extremely accurate and dependable in maintaining directional control for the Paladin system. There is no requirement for the operator to check the Paladin for directional control during normal operations. However; some units may require operators conduct verification of direction of the system. If verification of direction is used, the following proven techniques will give leaders a reasonable assurance that directional control of the Paladin is operational. The COS must always be aware of the AOF as it relates to the tactical situation. This is particularly important when traveling or conducting survivability moves, as the section chief can position to shoot emergency missions and resolve mask problems during occupation much faster. During occupation, the COS should ensure the howitzer hull and gun tube is oriented along the AOF. This will ensure faster

mission times when attacking targets along the AOF. Before he takes the tube from travel lock, he may conduct verification of direction to ensure the system is reporting proper direction. He can verify direction using the M2 compass method, tube to tube method, or any of the methods listed in FM 6-50. The method used is determined by METT-TC. The M2 compass method is normally faster than the tube to tube method, but the latter method allows all section members to remain in the howitzer.

### The M2 Compass Method

3-92. The gunner exits the howitzer and moves to the rear of the piece not less than 10 meters to get an accurate reading from the compass. He orients the compass by siting along the side of the turret or along the length of the tube. The compass reading must be within 100 mils of the azimuth displayed on the AFCS.

### The Tube to Tube Method

3-93. The gunner sites through the bore of the cannon and aligns his gun tube on the gun tube of a second howitzer. Both gun tubes are pointed directly at each other and the subordinate chief/wingman reads his azimuth of lay to the senior chief. The senior chief then reads his AFCS azimuth and compares the two (adding or subtracting 3,200 mils as required). If the wingman is positioned to the left of the team leader, the senior chief adds 3,200, and if to the right, he subtracts 3,200. The two readings must be within 10 mils to be valid. If performing the tube to tube method during platoon operations, the procedure is faster if the senior chief flanks his wingmen. The two wingmen orient on the senior chief and the senior chief sequentially verifies direction with each of his wingmen.

## SECTION VI - COMBAT SERVICE SUPPORT

3-94. The principles for CSS do not differ significantly from FM 6-20-1. The primary responsibility for CSS rests with the battalion. The battery leadership must be prepared to execute with sound TSOPs and TLPs. The decentralized nature of Paladin CSS operations demands development of coordinated and standardized procedures. The following concepts ensure logistics requirements are met effectively and efficiently. These concepts are guides that can be tailored to meet the needs of any type of Paladin organization to include separate howitzer batteries in the armored cavalry regiment (ACR). The organization of the "battalion trains" varies with METT-TC. For a Paladin battalion, the trains are organized for combat as dual trains: the field trains and combat trains. This type of organization provides immediate responsive forward support, flexible resource usage, and increased resource survivability.

## COMBAT TRAINS

3-95. The combat trains should be close enough to the forward line of own troops (FLOT) to be responsive to the forward units. If possible, it should not be within range of enemy direct fire. In less fluid operations, it is normally

located about 5-8 km behind the battery or platoon firing positions and 2-3 km from the TOC. It is organized to provide immediate critical CSS and to support multiple LRPs. In highly mobile operations, it may be necessary to position CSS elements forward to facilitate rapid R3SP operations.

## COMPOSITION

3-96. Listed below is an example of a combat trains. Actual composition will be based on the mission of the battalion and METT-TC.

- Recovery assets (up to three M88A1s and one HEMTT wrecker).
- One-third of the ammunition palletized load system (PLS) vehicles.
- Battalion aid station (BAS).
- Administrative logistics operations center (ALOC) (include enough S1/S4 personnel to man two shifts).
- One-half of the petroleum, oils, and lubricants (POL) section.
- Unit maintenance collection point (UMCP) includes required maintenance personnel and assets.
- SCP/CCP (situation permitting).
- DS maintenance contact team (-).

## RESPONSIBILITIES

### HHB Commander

3-97. The HHB commander is responsible for combat trains operations to include: RSOP; movement; internal operations; and the preparation of R3SPs. He coordinates litter team support for the BAS and conducts TLPs necessary to meet mission requirements for all elements of the combat trains.

### HHB 1SG

3-98. The 1SG's primary responsibility is administering the personnel and logistical matters of the combat trains and the TOC. He assists the HHB commander in conducting reconnaissance and coordinating perimeter defense. He further coordinates with the battalion ammunition officer (BAO) for locating and securing flat rack transfer points (FRTPs).

### S4

3-99. The S4 supervises the ALOC, maintains the situation map, and tracks the battle to ensure execution of CSS triggers. He is further responsible, during the battalion orders process, for coordinating with the XO, S3, HHB commander, and service BC in selecting potential trains, LRP, and R3SP locations.

### Battalion Ammunition Officer (BAO)

3-100. The BAO coordinates with the S3, XO, and S4 in planning and executing the ammunition distribution plan. He monitors the command and administration and logistics (A/L) nets for ammunition requirements. Additionally, he coordinates with the HHB commander and the XO in the reconnaissance and preparation of R3SP sites.

### Personnel Services NCO (PSNCO)

3-101. The PSNCO is the NCOIC of the ALOC. He monitors nets and ensures logistics and personnel reports are received and forwarded to the battalion support operations center (BSOC). Additionally, he assists the S4 with battle tracking.

### Battalion Maintenance Technician (BMT)

3-102. The BMT supervises the UMCP; assesses deadlined and damaged equipment; and recommends when, where, and how to best make repairs based on guidance from the BMO, XO, and the factors of METT-TC.

### CONCEPT OF OPERATIONS

3-103. The ALOC provides C2 for all CSS functions of the combat trains. As a forward deployed logistical unit, the combat trains provides firing platoons with immediate resupply (Class III, V, VIII) and mass casualty support. The combat trains must maintain the capability to rearm and refuel the platoons. Combat trains personnel exchange empty fuel trucks and PLS flat racks for full fuel trucks and PLS combat configured loads (CCLs) as they are pushed forward from the field trains. The UMCP is established to provide forward maintenance support to the battalion. The combat trains also provides medical support to the battalion through the BAS and supporting litter teams. Litter teams are special teams and are assembled from non-medical personnel assigned to the combat trains. Medical personnel must not be distracted from treating the wounded to carry litters and send routine radio traffic.

## FIELD TRAINS

3-104. The field trains is organized of elements not included in the combat trains and not required for immediate support of the batteries. It is normally located 15-20 km behind the FLOT (METT-TC driven) in an area providing easy access to main supply routes (MSRs), the brigade support area (BSA), and forward units.

### COMPOSITION

3-105. The field trains consists of the following elements:

- BSOC (S1/S4 sections minus those assigned to the combat trains).
- Remaining ammunition PLS vehicles (those not forward).
- Consolidated food service sections.
- Battalion maintenance section (-).
- DS maintenance contact team (-).
- Remaining POL assets (those not forward).
- Battery supply sections.

## RESPONSIBILITIES

### Battalion XO

3-106. The XO oversees all the logistical resupply functions of the battalion. He coordinates with the S3 concerning resupply and tactical operations. The XO operates where he can best influence the battalion's CSS effort.

### Service BC

3-107. The service BC serves as the field trains commander and is responsible for the RSOP, movement, and internal operations. He performs troop leading procedures and time management to ensure Class I, ammunition, fuel, and repair parts are pushed forward to meet mission requirements.

### Service 1SG

3-108. The service 1SG assists the service BC and coordinates with BSA personnel for local security of the trains and soldier support activities.

### S1

3-109. The S1 supervises the BSOC with the primary duty of personnel management. He maintains the situation map, tracks the battle to ensure execution of CSS triggers, and coordinates with the forward support battalion (FSB) medical company commander for planning medical support.

### S4 NCOIC

3-110. The S4 NCOIC monitors nets and ensures logistics and personnel reports are received from the ALOC and forwarded to the FSB. He oversees the logistics package (LOGPAC) to ensure requests for supplies are received from the FSB and assembled onto the trucks for delivery with the LOGPAC. Additionally, he assists the S1 with battle tracking.

### Battalion Ammunition NCO

3-111. The battalion ammunition NCO assists the BAO with resupply operations, manages ammunition vehicles, supervises driver's schedules, and resupply operations to the brigade ammunition transfer point (ATP).

### Battalion Maintenance Officer (BMO)

3-112. The BMO advises the BSOC of the battalion's maintenance status. He manages the battalion maintenance area, overseeing the operations of the DS maintenance contact team. He coordinates with the BMT and maintenance sergeant for Class IX resupply and major assemblies replacement.

## CONCEPT OF OPERATIONS

3-113. The field trains continuously anticipates, requests, coordinates, and conducts CSS operations. As required by the tactical mission, the field trains pulls supplies from the BSA, pushing them forward to the combat trains, LRP, and R3SP. The BSOC serves as the coordination and control center for

the battalion S4 section, personnel and administration center, maintenance elements not forward located, and the battalion supply section.

## BATTALION RESUPPLY

3-114. The battalion resupply system functions are described in FM 6-20-1 and FM 6-50, Chapter 12.

### CLASS I OPERATIONS

3-115. The battalion is the lowest level that should prepare and issue rations.

3-116. The battery 1SGs oversee Class I operations through the use of the battery supply sergeants located in the field trains. The battery supply sergeants will receive the Class I items and deliver them through the battalion LOGPAC to the batteries. Units should develop TSOPs addressing Class I operations that are characterized by dispersion and high operating tempo (Paladin tactics).

### CLASS III OPERATIONS

3-117. Battalion Class III operations are managed and controlled by the C2 elements of the trains. The fuel consumption of the M109A6 is greater than previous M109 series howitzers due to increased mobility and the requirement to run the engine during the conduct of fire missions. The increased demand for fuel requires detailed planning during mission analysis. Units will resupply at scheduled intervals, for normal operations, and push fuel forward as required during periods of increased optempo. Units should consider the following when developing TSOPs:

- The battalion's tankers receive fuel from the FSB in the BSA and are positioned in the field trains and combat trains.
- During normal operations, a platoon is refueled at the R3SP site or through LRP operations. However, the platoon/battery can coordinate with the ALOC for emergency POL support. The HEMTT tanker links up with the platoon/battery at the predesignated refuel point, conducts the refuel, and then returns to its base of operation or refuel location.
- As the combat trains runs low on Class III, fuel can be transloaded to one tanker and the ALOC coordinates with the BSOC for replacement tankers.

### CLASS V OPERATIONS

3-118. The Paladin battalion must organize the ammunition platoon to operate efficiently and routinely. The battery ammunition PLSs are managed at the battalion level. A section of three PLSs remain habitually dedicated to each battery to facilitate command and control. The same section should resupply the same battery as often as possible. This practice allows each ammunition section chief and his BC to exercise established battery internal resupply operations, troop leading procedures, and simplifies navigation to/from that battery during static operations. The PLS supports this technique with quick and easy flat rack exchange. Ammunition section chiefs must control battery ammunition resupply IAW battalion/battery directives. The S3, S4, and XO coordinate priorities and issue guidance to the BAO. The

BAO or S4 issues the distribution plan to commanders at the field artillery support plan (FASP) briefing. BCs include ammunition resupply in their battery orders, rehearsals, and TLPs. Resupply may routinely be accomplished by the double loop, the single loop, R3SP, or any combination of these methods.

### Double Loop Method

3-119. The double loop method is the quickest, most efficient, and normally the preferred method of resupply. The ammunition platoon must operate across the entire brigade zone. The battalion must organize the ammunition platoon to facilitate command and control of the double loop method. A preferred technique is to position three PLSs with each firing battery and position the remaining nine between the combat trains and field trains. This organization, based on METT-TC, establishes a basis for routine operations. The double loop method utilizes the PLS's flat rack swapping capabilities with ammunition uploaded on flat racks in the ATP, and pushed forward to a FRTP. Trucks carrying empty flat racks from a battery resupply point, exchange their empty for a full flat rack at the FRTP. Trucks with loaded flat racks return to their battery, a resupply point, or the combat trains. Trucks with empty flat racks return to the ATP. When possible, establish the FRTP in the vicinity of the combat trains.

### Single Loop Method

3-120. In the single loop method, operators draw ammunition from the ATP and deliver to the battery position. This method may be required for emergencies such as late ammunition shipments to the ATP or last minute changes to the resupply plan. Success depends on the ability of each driver to navigate between the ATP and the battery location. This requires detailed movement briefings or a leader to personally guide the convoy. Empty flatracks are returned as directed.

3-121. Regardless of the method of resupply, the battalion must maintain strict ammunition accountability and lot management. This ensures adequate amounts of a single propellant and projectile lot are on hand. The S4, S3, and BAO develop several flat rack load plans for the TSOP. Flat rack load plans may be CCLs based on the battalion's basic load, controlled supply rate (CSR), unit mission, and EFATs. Flat rack load plans may include trucks loaded by type (i.e., all dual-purpose improved conventional munitions (DPICM)) or trucks with a mixture of munitions supporting EFATs (i.e., area denial artillery munitions (ADAM)/remote antiarmor mine systems (RAAMSs) for a medium density minefield).

## REARM, REFUEL, RESUPPLY, AND SURVEY POINTS (R3SP)

3-122. The battalion staff must consider the advantages and disadvantages of the R3SP. The R3SP is the most expedient method to resupply. It is the most convenient means for the battery leadership, as their involvement is minimized. The R3SP may be used at the battery level when distance and location prevent the use of a battalion R3SP. R3SPs are established along the route the platoon travels as it makes a tactical move. This is a "get in and get out" operation. The goal is to refuel, rearm, and resupply in less than 30

minutes. When possible the Paladin will be rearmed by their FAASVs prior to a tactical move. This simplifies the R3SP, allowing the howitzers to bypass the rearm area and move directly to the refuel area. Actions performed at the R3SP include: refueling; rearming of the FAASVs; updating navigation systems; issuing POL products; and the distribution of rations, mail, sundries, and other items.

3-123. In concert with the XO and S3, the S4 identifies the location of the R3SP. The HHB commander/BAO/RSO reconnoiters the site, and coordinates for POL, ammunition, other classes of supplies, and survey to establish SCPs. A technique is to establish SCPs next to the tankers so that the howitzers can update their navigation systems as they receive fuel.

3-124. The rearm and refuel operations are separated by 300-600 meters. The rearm operation requires a 500-800 meter area with approximately 100 meters between flat racks. The refuel operations require a 200-400 meter area with 50-100 meters between the HEMTT tankers. The actual size of the R3SP will be terrain dependent. Once refueled, the howitzers continue on to their next position. The POC and FAASVs complete rearm and refuel operations and continue their tactical moves.

## LOGISTICS PACKAGE (LOGPAC) OPERATIONS

3-125. The most efficient method of resupply is accomplished through LOGPACs. FM 6-20-1 discusses LOGPAC operations. Class I, III, and IX are routinely delivered via the LOGPAC. Additional classes of supply may be included in the LOGPAC based on unit requirements. Units may submit daily personnel, logistics, and maintenance reports (hard copy reports that supplement and clarify FM feeder reports) with the LOGPAC.

3-126. The LOGPAC is assembled in the field trains. LOGPACs are organized for each battery and separate elements in the battalion. Once assembled, the vehicles move to the LRP under the control of an OIC or NCOIC. At the LRP a battery representative receives his LOGPAC and conducts unit level resupply. Following resupply, the trucks assemble at the LRP and return to the field trains.

3-127. The ideal place for the battalion's logisticians to meet and coordinate logistics requirements is the LRP. Here they rehearse future logistics operations, discuss changes to plans, and review personnel, logistics, and maintenance reports.

3-128. The LOGPAC offers many advantages. The most significant is increased C2 for moving supplies over the long distances. It provides the framework for safely moving supplies without stifling the initiative of individual supply sergeants. Effective LOGPAC operations reduce the number of trips between the field trains and forward deployed units. Finally, LOGPAC operations provide the proper setting to exchange information.

3-129. The battalion S4 plans and coordinates LOGPAC operations to ensure they fully support the commander's tactical plan. Planning must begin early, be METT-TC dependent, and updated continuously to ensure subordinate units are properly supported.

## BATTERY RESUPPLY

### CLASS I OPERATIONS

3-130. The battery 1SGs oversee the Class I operations through the battery supply sergeants located in the field trains. The battery supply sergeants will receive the Class I items and deliver them through the battalion LOGPAC. Batteries will normally maintain a 3-day supply of water and rations.

### CLASS III OPERATIONS

3-131. The fuel consumption of the M109A6 is greater than previous M109 series howitzers due to increased mobility and the requirement to run the engine during the conduct of fire missions. The increased demand for fuel requires detailed planning during mission analysis. Battery Class III resupply is normally provided through LOGPAC or R3SP operations.

### CLASS V OPERATIONS

3-132. Frequent movement complicates ammunition resupply. The BC must ensure the orderly flow of ammunition from the battalion to the battery. He must be proactive, including ammunition resupply in his TLPs. Platoon leaders, platoon sergeants, section chiefs, ammunition section chiefs, and ATCs must ensure that operators of FAASVs and PLS vehicles are aware of pickup points, routes, and when they can anticipate resupply to occur. Ammunition resupply is accomplished from either a battery or a platoon rearm point.

#### Battery Rearm Point

3-133. The battery rearm point is normally established on the movement route and centrally located between the two platoons. Rearm can then be accomplished as the unit moves to the next location. This site can easily be converted to a battery R3SP by coordinating for survey and with the combat trains for additional classes of supply. A typical battery rearm point would have two flat racks, capable of simultaneously servicing six FAASVs. Each section would take 58 rounds, from the two flat racks (each flat rack carries a standard 176-round CCL). Another setup might have one flat rack on the ground and require sections from each platoon rotate through the rearm point. Each section would take 29 rounds from the 176-round CCL flat rack. It is important to empty flat racks as soon as possible so they can be returned to the ATP and continue the battalion's ammunition push.

#### Platoon Rearm Point

3-134. The platoon rearm point is similar to that of the battery. However, establishing one per platoon facilitates autonomous operations. When the platoons are widely separated, this is the preferred method. The platoon rearm point is centrally located outside of each firing area. While this method reduces turnaround time for the FAASVs, it is more difficult for the ammunition section chief to control and may slow the turnaround time for the PLSs. A typical platoon rearm point would have one flat rack with a 176 CCL positioned on the ground and three sections would rearm 58 rounds each. As is the case with a battery rearm point, the platoon rearm site can be

positioned for rearm enroute to the next location and, if necessary, can be converted to a battery R3SP.

## PLATOON RESUPPLY

### CLASS I & III OPERATIONS

3-135. Platoon Class I and III operations are managed by the platoon leader/platoon sergeant and are coordinated through the battery 1SG.

### CLASS V OPERATIONS

3-136. There are two options available to the platoon leader for delivery of Class V to the individual sections. The method used depends upon the required mix, the rate of ammunition expenditure, and expected enemy threat.

#### One FAASV- One Howitzer

3-137. One approach is to permanently assign one FAASV per howitzer section. The assigned FAASV resupplies Class V to the howitzer section. After resupplying, the FAASV crew provides the COS a properly completed DA Form 5969-R (reference FM 6-50). This form will facilitate the update of the section ammunition inventory in the AFCS. The COS adds this ammunition to his on-board totals and transmits the overall total to the POC. The inventory must reflect the ammunition status of the howitzer and the FAASV. This facilitates the automated management of ammunition.

#### FAASVs in Support of a Platoon

3-138. Using this method, FAASVs are controlled by the platoon sergeant. Two FAASVs will resupply the howitzers, while the third is conducting rearm or performing overwatch. When two FAASVs have depleted their Class V supply, they are dispatched to the battery or platoon rearm point and the third takes over resupply of the howitzers. This method ensures availability of ammunition. However, it complicates ammunition accountability. The chief will not be able to input all of the "on-site" ammunition into the AFCS. The unit must have written procedures to account for the ammunition in the FAASVs.

3-139. When the expenditure rate is extremely high, “FAASVs in support of a platoon” better facilitates Class V resupply. During periods of minimal ground threat, “one FAASV – one howitzer” enhances the task of ammunition accountability. Regardless of the method of resupply, the POC is ultimately responsible to accurately report ammunition accountability. Consider the following information when planning ammunition resupply operations:

- The M109A6 basic load is 37 complete conventional rounds and two Copperhead rounds.
- The FAASV basic load is 90 conventional rounds and three Copperhead rounds.
- The FAASV may average from one to five rearming moves per day in addition to tactical and survivability moves.

- Ensure M109A6 has 100% of its basic load (Consider ammunition required for EFATs) prior to FAASV departing for resupply operations.
- When establishing resupply triggers, consider multiples of 8 to facilitate flat rack (155mm pallet) operations. Additionally, at the howitzer section level, it is recommended to establish numeric resupply triggers in lieu of "red, amber, green" status.

## UNIT MAINTENANCE

### OPERATOR/CREW MAINTENANCE

3-140. The Paladin crew performs PMCS, visual inspection, cleaning, and maintenance tasks authorized in applicable operator level technical manuals.

3-141. BITE allows for failure isolation to component and or line replaceable unit (LRU) as appropriate. The PDIU monitors M109A6 systems and provides feedback to the crew.

3-142. The platoon must set aside time to allow the Paladin sections to perform routine scheduled maintenance without greatly degrading the ability of the platoon to fire. This should be accomplished as part of the overall continuous operations plan in effect at any given time.

### ORGANIZATIONAL MAINTENANCE

3-143. The battalion's organizational maintenance assets provide timely maintenance and recovery support. They are located in battery PAs, combat trains (UMCP), field trains (battalion maintenance area), and in remote element locations to facilitate rapid response to the Paladin battalion.

### DIRECT SUPPORT MAINTENTANCE

3-144. DS maintenance is mobile, deployed forward, and designed for "repair by replacement" operations. DS contact teams from the FSBs perform maintenance. Normally, these teams are positioned in the battalion field trains. The platoon leaders coordinate DS maintenance support through the BC and the ALOC as required. Contact teams can repair most non-operational equipment at the platoon PA. Items beyond the repair capabilities of the contact team (such as communications, electronics, or NBC equipment) are replaced with a serviceable part, and the faulty part is evacuated for repair.

### RECOVERY

3-145. The Paladin battalion's tracked recovery vehicles (M88A1s) are positioned to facilitate any required recovery missions. They may be located in the combat trains or forward in the battery PAs. If the contact team or the DS maintenance team cannot repair the equipment on site, the recovery vehicle evacuates it to the UMCP or the field trains. The recovery vehicle may remain with the equipment to assist in repairs or move it if displacement is required. Once the vehicle is repaired, the recovery vehicle returns to the combat trains or PAs IAW unit TSOP. Guidelines for determining whether to repair on site or evacuate are found in FM 6-20-1.

The tactical situation and the anticipated length of time to complete the repair are primary factors in determining if evacuation is necessary.

## CASUALTY EVACUATION

3-146. Special consideration must be given to casualty evacuation in a Paladin battalion to reinforce responsiveness and dispersion. For a battalion to administer proper care to its wounded, the following medical assets are needed for routine evacuation.

### MEDICAL TREATMENT TEAM

3-147. This team includes an emergency treatment NCO and two medical specialists. Equipment includes two HMMWVs, one secure FM radio, two chemically and biologically protected shelter systems, and medical equipment sets for field trauma, sick call, chemical agent decontamination, and chemical agent treatment.

### AMBULANCE TEAMS

3-148. This team consists of one evacuation NCO and an ambulance driver per ambulance. It supports the medical treatment team in the firing batteries and battalion in medical evacuation. Equipment includes four HMMWV ambulances with FM radios, and secure GPSs.

### COMBAT MEDIC SQUAD

3-149. This squad consists of six combat medical specialists. One combat medic is allocated per firing platoon. Each medic carries a surgical kit.

### MASS CASUALTIES

3-150. For mass casualty evacuation, the battalion must rely on its combat lifesavers and organic transport capabilities in addition to its medical section personnel and medical transport capabilities. For planning purposes, a cargo HMMWV can transport up to five litter casualties and a 2 1/2-ton truck or 5-ton truck can transport up to 12 casualties (see FM 8-10-6, *Medical Evacuation in a Theater of Operations TTP*). Battalion or battery TSOPs should address a standard layout for a casualty collection point at the BAS and battery or platoon. Litter teams need to be identified and trained at every separate element within the battalion. Combat medics, combat lifesavers, and litter teams must conduct rehearsals to ensure they can effectively collect, provide aid, and transport casualties.

3-151. The battalion addresses, in the FASP, those actions to be taken in the event of mass casualties. If only one battery or platoon is hit, the closest battery provides combat lifesavers and evacuation vehicles. If two batteries are hit, the surviving battery and the combat trains provide assistance. When two or three batteries are hit, mass casualty assistance will likely have to come from brigade or task force assets. In any mass causality event, the battalion must resist diverting medical personnel from the BSA. The limited number of medical personnel should remain at the combat trains providing C2, through the combat trains/ALOC, and casualty assistance in a protected environment.